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Newsweek

05.26-06.02.2023

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For Love of Dog

The hot new field of "canine cognition" brings scientific insight to the burning question dog owners have: Is it only puppy love?

by ADAM PIORE



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Bhutan's PM on climate change and the rivalry between neighbors India and China

by DANISH MANZOOR BHAT

LOOKING AHEAD
"We are not obligated to remain carbon negative but we genuinely feel this is the right way forward. Being carbon negative is our wealth."

ABOVE Photograph by Danish Manzoor Bhat/Newsweek

This Issue Features Four Unique Covers









ILLUSTRATIONS Brit Spencer
PHOTOGRAPHS Clockwise from top left Catherine Ledner/Getty; Getty; SensorSpot/Getty; Rich Legg/Getty

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FROM LEFT: GRAY MALIN; GETTY

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The Archives

1953 "Elizabeth II will have reigned one year, three months, and 27 days when she is crowned on June 2. In that time, she has already learned how much work—and what little fun—there is in being sovereign," said *Newsweek* on her coronation. The longest-reigning monarch in the country's history, she ruled until her death at age 96 last September. King Charles III's coronation took place earlier this month, on May 6, at Westminster Abbey with all the customary British royal pageantry. Charles became the 40th reigning monarch to be crowned at the church since 1066.





1972

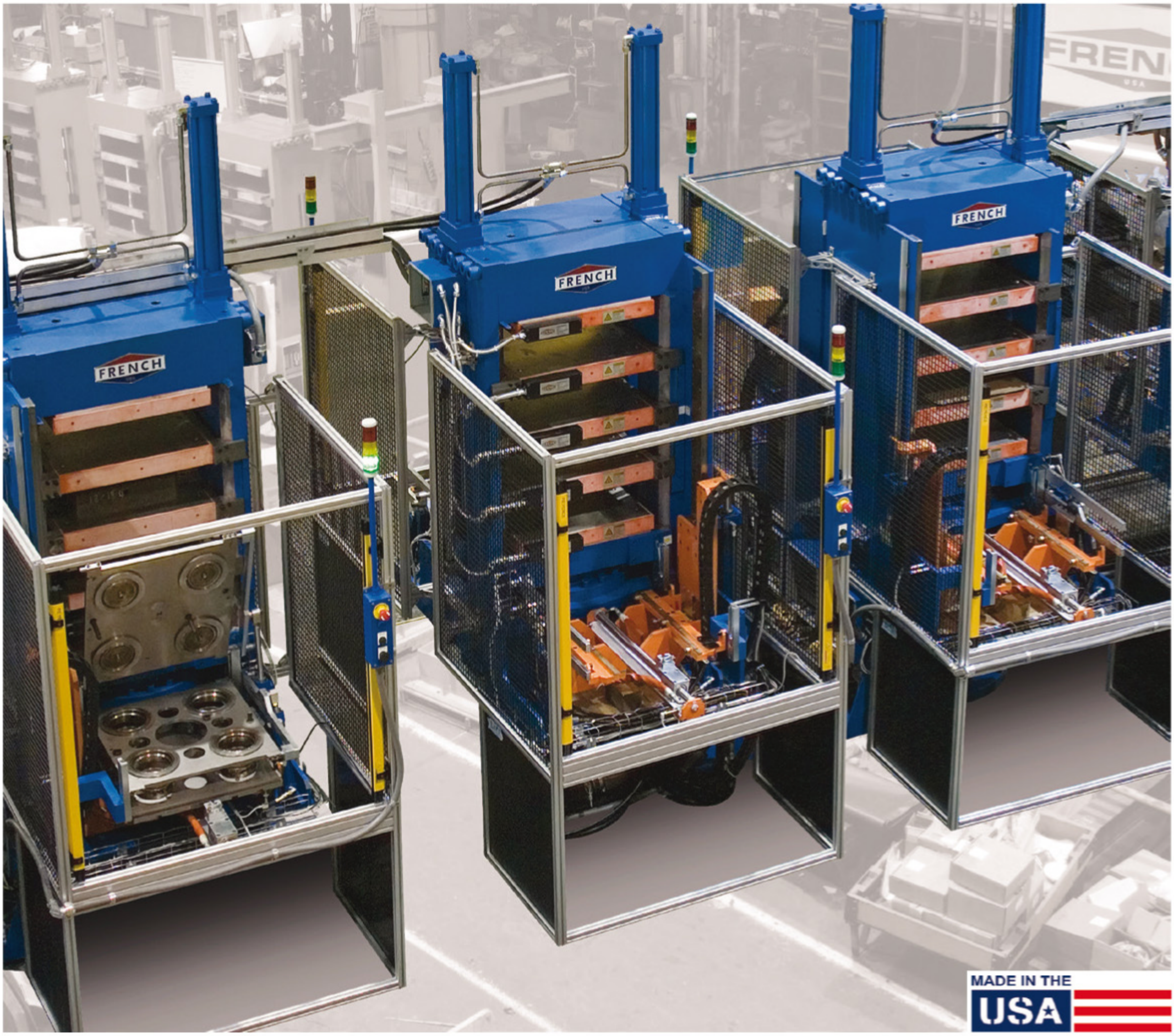
"After President Nixon's return from his historic China visit, *Newsweek* began preparing a special report on [the Moscow Summit,] the second leg of the President's global peace-keeping mission," said the magazine. Now, with China backing Russia in the war in Ukraine, relations between the superpowers stand far from detente.



1993

"Today's wars are fought over tiny strands of high-strength glass, called fiber-optic cable, and the pulses of light that they transport," said *Newsweek*. Technology—particularly cyberspace—is a significant consideration in modern warfare. The recently leaked Pentagon documents onto a Discord server, for instance, are a testament to this.

NEWSWEEK ARCHIVE (3)



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In Focus

THE NEWS IN PICTURES

TIJUANA, MEXICO

A New Frontier

A migrant climbs over the border fence into the United States after fetching groceries for other migrants waiting to be processed on May 10. On May 11, President Joe Biden's administration lifted Title 42, the strict immigration policy implemented by former President Donald Trump that denied entry to asylum seekers on the basis of the COVID-19 pandemic. Stemming from the Public Health Act of 1944, Title 42 granted federal officials emergency powers to prevent the spread of diseases. Along the border, authorities are preparing for an unprecedented surge of migrants seeking asylum from political instability and poverty.

GUILLERMO ARIAS

AFP/GETTY





SEOUL, SOUTH KOREA

Young Monks

Monks pray during a ceremony to prepare children to live as Buddhist monks for three weeks at Jogyesa Temple on May 9, part of the Buddha's annual birthday celebration where children ages 6 and 7 shave their heads and learn in-depth about Buddhism. The novices kicked off their duties May 11 at the gwanbul ceremony, during which a statue of the baby Buddha is bathed in water.

▸ CHUNG SUNG-JUN

PESHAWAR, PAKISTAN

Powder Keg

Pakistan Tehreek-e-Insaf (PTI) party activists and supporters of former Prime Minister Imran Khan clash with police during a protest against Khan's arrest on May 9. The former prime minister was charged with corruption, igniting unrest in several major cities. On May 11, in a crucial win for Khan's supporters, the country's Supreme Court ruled his arrest unlawful and ordered he be released from custody.

▸ ABDUL MAJEED

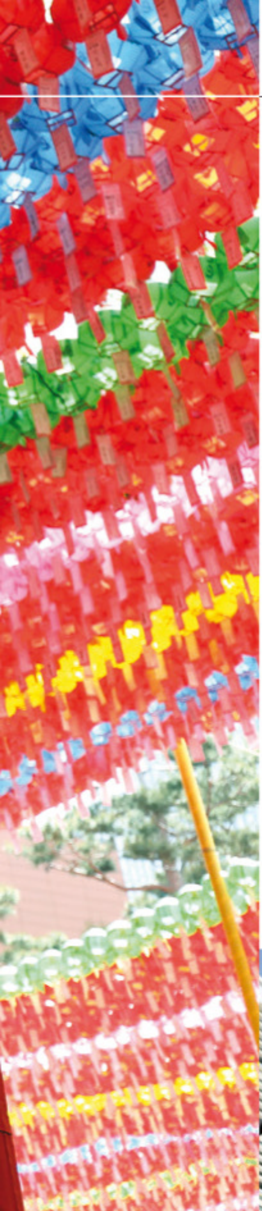
CENTRAL ISLIP, NEW YORK

Havoc on the Hill

Representative George Santos of New York addresses the press as he leaves federal court on Long Island on May 10. Santos was charged with a 13-count indictment for wire fraud, money laundering, theft of public funds and making materially false statements to the House of Representatives. He pleaded not guilty. If eventually convicted on the charges, he could face federal prison time.

▸ MICHAEL M. SANTIAGO

GETTY (2); AFP/GETTY






DEVOLDER
DEFRAUDS
VOTERS
news 12





GETTY

HEALTH

Pollen Proliferation

You're not imagining it. Your seasonal allergies ARE getting worse. Blame climate change

Achoo! This spring, seasonal allergy symptoms are as bad as they've ever been for many people...or worse. Tissues, antihistamines, nose sprays, inhalers and eye drops are constant companions for the growing number of people who suffer from allergies. Around 40 percent of all people have at least one allergic condition today, and unfortunately, the outlook for the future isn't much brighter. But why? Acclaimed medical anthropologist Theresa MacPhail investigates the history of allergies and traces the causes of their increasing prevalence in her book, ALLERGIC: OUR IRRITATED BODIES IN A CHANGING WORLD *(Random House). She explains why there's an uptick in all allergic conditions—food allergies, asthma, eczema, environmental allergies and more—and what we can do about it. In this excerpt from her book, MacPhail focuses on why climate change is a leading cause of your increased hay fever symptoms.*

by **THERESA MACPHAIL**

IF YOU'VE FELT AS THOUGH YOUR EYES WERE itchier, your nose was stuffier, or your sneezing fits have been getting worse over the past few years, you're probably correct. The reason likely has something to do with changes to the average pollen load (the amount of pollen in the air), the air quality itself (whether on average it is good, fair or poor) and the indirect effects of climate change on everything from the number of mold spores to crop production to trapped heat to the circulation of air.

Scientific researchers have amassed evidence showing that recent environmental changes are both overwhelming and confusing to our immune systems, helping to drive the increase in the global rate of all allergic conditions throughout the last century. They've found that the changes to the air we breathe correlate with an increased risk of developing allergic disease.

Perhaps some of the strongest evidence in support of the idea that our environments are to a certain extent causing the increase in all our allergies comes from studying our white blood cells themselves.

New research (2020) from the Wellcome Sanger Institute, a leading nonprofit research institute in the United Kingdom, shows that the more our

Photograph by ASHLEY COOPER

T cells have reacted to an antigen (say, dust mites) in the past, the faster they react in the present.

Researchers found that when "naïve," or inexperienced, T cells were given a specific chemical signal, they first responded to it by calming down or limiting the immune response. But with more "experienced" T cells, or cells that had encountered the antigen before, the reaction was the total opposite. Those more experienced immune cells ramped up inflammation. In other words, the more times you're exposed to cedar pollen and particulate matter, the worse your reaction to them might be. In places with heavy pollen loads and poor air quality, that means more respiratory allergies, more asthma—and perhaps more severe symptoms.

The fact that so many asthma patients also struggle with respiratory allergies doesn't surprise researchers. Dr. Robert Schleimer, former chief of the Division of Allergy and Immunology and now professor at Northwestern's Feinberg School of Medicine, explains that an asthma patient has a 90 percent probability of having hay fever.

Schleimer explains, "The unified airway hypothesis argues that allergic inflammation, when it occurs in the respiratory tract, tends to occur everywhere in the entire respiratory tract."

The theory is also supported by more than two hundred years of observations and scientific research on hay fever, asthma and the relationship between exposure to antigens in the air and the development of respiratory allergy. And because of climate change, agricultural growing seasons—especially in the North—are elongating. EPA maps from 1995 to 2015 show an average increase of 21 days in the pollen

Q & A

Theresa MacPhail

BY MEREDITH WOLF SCHIZER

Q _ Climate change is one factor causing increased respiratory allergies. What about the equally dramatic rise of eczema and food and drug allergies? Is our natural environment to blame for them as well?

A _ Climate change is just one factor that is contributing to the problem. For our skin and gut, changes in our lifestyles and other man-made environmental changes are adding to the stresses on our immune cells. There are more than 85,000 chemicals listed under the EPA's Toxic Substances Control Act, and obviously we're interacting with things we wouldn't have even 70 years ago. Also, the types of food we eat are dramatically different, and we're consuming more processed foods than ever before. For example, most Americans don't get enough natural fiber in their diets and that can dramatically affect the normal bacteria in our guts. It's just everything all at once, combined, that is making things worse for our ancient immune systems.

What's the most surprising thing you learned when researching this book?

The fact that our own individual T cells, key components of healthy immune systems, can make different decisions about an allergen even though everything else is the same: diet, environment and genetics. When I come into contact with something, some of my cells will decide that it's harmless and some will decide it's not. So really, our immune response is about tipping that balance with more cells deciding something is a problem than tolerating it. And we largely have no idea why our cells are making those choices.

Allergic conditions are common in families, even if members don't all suffer from the same ones. Is there any way to prevent them? What can we do to limit allergies?

There aren't any hard and fast ways to avoid developing an allergy, but we do know that in general more exposure to more things early on in life are better. Letting our kids interact with other kids, cutting back on unnecessary antibiotics and



antimicrobial cleaning products, playing with dogs…these all correlate with lower rates. But again, there's a lot we still don't know. I would tell anyone who has kids with allergies not to feel guilty about what they have or haven't done. You didn't cause your child's allergies.

Allergies can be very expensive for the patient, from special food to essential medications. The mental load can be extraordinary too, yet it is so often hidden. What can be done to offer support?
I think educating more people about the economic and emotional burdens that come along with a moderate to severe allergy diagnosis would go a long way to alleviating some of what allergy patients have to cope with. Recognizing that allergies are actually more of a problem for people than we have been socialized to think they are would be a terrific start. And never assume someone is faking or exaggerating an allergy. Try to remember that folks with allergies don't want to ruin your cookout—they're just trying to protect themselves or their kids.

Advice to minimize food allergies has changed over the last 20 or so years—first recommending complete avoidance of allergens like peanuts for young children and now encouraging early exposure (in most cases). If you were a new parent, how would you assess all the different guidance coming out? Why is there so much change?
Being a parent is more difficult than ever. All the latest guidance is based on what we currently know—and that can and probably will change as we learn more. But that's just how science works. We keep trying to figure out the basic biological mechanisms behind allergy and, as we do, we'll be able to give better advice. But for now, early introduction of trace amounts is doing a better job of preventing serious allergic reactions than the former advice to hold off until they are older.







CLOCKWISE FROM LEFT: SD STUDIO; GETTY; RANDOM HOUSE

Is exposure to allergens generally recommended as a treatment for all types of allergies now? How is that consistent with—or at odds with—the idea that the body's immune system gets hyperreactive with more exposure?
This is a tricky one! Immunotherapy—or the process of introducing trace amounts of an allergen and gradually increasing those amounts over months to years to induce tolerance—doesn't actually work for everyone. Immunotherapy shots for respiratory allergies are especially difficult to predict; they have far worse success rates than immunotherapy for something like peanut allergy. The other thing to remember is that even if treatment is successful, that tolerance isn't permanent or stable without regular maintenance doses.

INSPIRED *Author MacPhail has a personal interest in allergies; she suffers from them. In the spring, "we're basically coated in pollen."*

In your book you say that pets have allergies, too. Do all animals get allergies? Do pet owners need to worry about their furred companions suffering?
As far as we know, no animals "in the wild" develop allergies—just the ones that live alongside us. Typically, the symptoms are itch for dogs, birds and horses, and cough or wheezing for cats. Usually, the culprit is their food. Allergies in pets seem to be on the rise, so pet owners should definitely be on the lookout for anything unusual. Your vet may be able to help with their worst symptoms.

Are *your* environmental allergies worse lately, too? Do you have any tips for managing them?
Absolutely. I used to have a pretty easy time of it, but in the last year or two as pollen loads have increased and the pollen seasons have lengthened, I definitely have noticed a lot more itching and wheezing and sneezing. I start taking my meds early, before the pollen season starts, and I take showers immediately after coming home if I've been spending a lot of time outdoors. We're basically coated in pollen when we get back home, so it's not a bad idea if you're suffering.



season in Minnesota, 15 days in Ohio and six days in Arkansas. A study conducted at the University of Maryland between 2002 and 2013 and involving 300,000 respondents showed that hay fever increased whenever the timing of spring changed. The prevalence of hay fever increased by as much as 14 percent when spring came early.

Take ragweed—one of the biggest natural environmental triggers of respiratory illness. Ragweed is a flowering plant native to the Americas. It is notorious both for its proliferation and for its pollen. In many ways, the story of ragweed in the past 200 years has become the paradigmatic example of how environmental changes can have an enormous impact on allergies. Ragweed is very sensitive to any changes in the level of carbon dioxide, or CO_2. Its production of pollen intensifies with higher CO_2. Rising levels of CO_2 in our atmosphere, while terrific for ragweed, are disastrous for allergy sufferers everywhere.

But the problem doesn't stop with ragweed.

Dr. Richard Primack, a biology professor at Boston University, knows a lot about pollen—both personally and professionally. When he was a graduate student studying the ribwort plantain, a flowering species of plant that grows best in environmentally disturbed landscapes, he developed a severe respiratory allergy to its pollen. It's one of the occupational hazards, he tells me, of being a botanist.

When I call him, it's mid-fall and 70 degrees and he's eager to talk about the production cycle of natural allergens. The topic is right up his research alley. Dr. Primack's biology lab at BU focuses on the effects climate change has on the timing of biological events like spring pollination. When I ask him about the proliferation of pollen and mold spores, he's more than happy to discuss the many changes he's observed over the past four decades.

In sum, if you think your seasonal respiratory allergies have been getting worse each year, you're probably right. Pollen and mold spore levels have indeed been shifting. Several climate factors are currently intersecting to compound the problem.

Warming Temperatures

Most obviously, the temperatures are warming. Spring seasons are, on average, happening much sooner—beginning as early as February in some locations—so plants and trees that respond to warmer temperatures are flowering earlier, too. At the other end of the growing season, fall temperatures are much milder, which allows plants to flower for extended amounts of time.

"In the New England region, where I'm from, there would generally be cold weather starting in late September and a killing frost sometime in early October," Dr. Primack explains. "And that would really stop all the grass plants, the ragweed and other pollen-producing plants from flowering. And what's happening now with climate change is that the weather is fairly warm throughout September and into October. This year, we had warm conditions and plenty of rainfall in October, so plants like ragweed just kept growing and producing more flowers."

> **"It's just everything all at once, combined, that is making things worse for our ancient immune systems."**

When plants like ragweed emit pollen long into the fall months, it means extended misery for those of us who suffer from ragweed allergy. But climate change is not just creating a bigger problem for respiratory allergy sufferers. What other allergenic plant loves the new weather patterns? Poison ivy.

"Poison ivy is just dramatically more common now than it was when I was growing up," Dr. Primack says matter-of-factly. "These types of plants are spreading, they're more prolific and they're in places where they didn't occur before."

Air Pollution

Some plants benefit from air pollution itself. More circulating CO_2 is advantageous for plants like ragweed and poison ivy. But plants also really love higher nitrogen levels.

"In the past, soil nitrogen was a limiting nutrient for many plants," Dr. Primack says. "But because of increased burning of fossil fuels—like oil, coal and natural gas—there's more nitrogen dust being generated. And this dust, when it falls on the ground, fertilizes the soil. So plants like ragweed are able to take advantage of higher nitrogen in the soil, greater amounts of CO_2 in the air and warmer temperatures to grow more prolifically than they did in the past and to produce more pollen."

Invasive Plants...and Mold

A bevy of environmental changes have also produced better breeding



NO RELIEF Hay fever increases with changes to the timing of spring —as much as 14 percent with early spring weather.

GETTY

grounds for more invasive species of plants. Places like Southern California, Arizona and New Mexico are seeing increased levels of pollen due to an influx of invasive species of grasses—like Bermuda grass, which produces more pollen and can cause worsened allergic symptoms. The Midwest is seeing the effects of milder weather with grasses flowering much later than they typically do. And in the South, with its already high levels of humidity, things are getting wetter and hotter—a bad combination for those of us with mold allergies. Those are ideal conditions for mold growth and there are more mold spores in the air.

In essence, then, there isn't a single area within the United States that isn't seeing the direct effects of climate change on allergens. And while we may all be dealing with slightly different problems—from mold to ragweed to oak trees to invasive grasses to poison ivy—they're all pointing us toward greater irritation.

The Future of Pollen Counts

Pollen levels, in general, are expected to double by 2040, and the pollen will be more "potent" (its peptide levels will rise, likely worsening our immune system reactions). A recent study suggested that longer pollen seasons will lead to more emergency room visits for allergic asthma. The study focused on oak pollen, which already sends approximately 20,000 people to the emergency room each year in the United States alone. Research done at the Mayo Clinic in 2017 linked climate change to an increase in CO_2 levels that led to an increase in fungal growth. The study found that exposure to fungus lowers cell barriers, causing cell inflammation that can worsen allergies. Climate change is also causing worse flooding and higher temperatures around the world. And that means more mold, as we've already begun to witness in places like Chandigarh, India, and in New Orleans, where allergy rates began to skyrocket after Hurricane Katrina. Climate change is also altering weather patterns, and storms exacerbate respiratory allergy and asthma symptoms—a phenomenon called thunderstorm asthma. Rainfall ruptures bioaerosols and lightning strikes fragment pollen grains, then increased winds distribute those ruptured fragments for miles and miles. In 2016, a thunderstorm asthma event in Melbourne, Australia, sent more than 10,000 people to the emergency room with difficulty breathing over just two days.

Ultimately, the natural environment matters deeply to the development of allergic irritation. What our bodies are regularly exposed to—or not exposed to—has a significant and lasting effect on our immune functions. But climate change and its dramatic effects on pollen is only one part of a much more complicated story behind the recent spike in allergies. The countless changes we've made to our man-made environments (such as our homes and offices) and our lifestyles over the last two centuries are wreaking just as much havoc on our immune functions as changes to the natural environment. It's a complicated puzzle that needs our immediate attention, especially if we're all going to breathe easier anytime soon.

▸ *Adapted from the book* ALLERGIC. *Copyright © 2023* **Theresa MacPhail**. *Published by Random House.*

FOR THE LOVE OF DOG

THE HOT NEW FIELD OF

BY ADAM PIORE



GETTY

Photograph by INSIDE STUDIO

‘CANINE COGNITION’ BRINGS SCIENTIFIC INSIGHT TO THE BURNING QUESTION DOG OWNERS HAVE:

IS IT JUST PUPPY LOVE?



IT'S PROBABLY IMPOSSIBLE TO know exactly what your dog is thinking. But a few years ago, Gregory Berns, a neuroscientist at Emory University, decided he wanted to try and find out anyway.

The catalyst was Bern's diminutive pug Newton, a fawn-colored pooch with a friendly disposition and a small black mole on his cheek vaguely reminiscent of a young Robert De Niro. Every night for more than a decade, Newton climbed into bed with Berns and his wife and nestled his meatball-shaped head into the crook of the neuroscientist's armpit, before passing out and snoring loudly. The routine continued even after Newton grew so arthritic that he relied on a tiny-wheeled cart attached to his hind legs to tow himself around and required assistance to get into the bed.

When Newton finally passed away at the ripe old age of 97 (in dog years), Berns was so devastated that he began to ruminate on the nature of their relationship. Yes, he really had loved that little guy intensely. But had Newton, he wondered, felt the same way about him? Berns tried not to dwell on the question. It was sad to contemplate the possibility that for Newton their relationship might have come down to nothing more than a hankering for dog treats or a new chew toy. And how could one ever really know what went on in the head of an animal?

A few months later, while watching news footage of a trained dog participating in the military operation to capture Osama bin Laden, Berns had an epiphany. If a dog could remain calm during a military raid, perhaps he could train his new pet terrier to lie still in an MRI machine long enough to scan her brain and see how she thinks.

Since then, Berns has scanned the brains of more than 100 dogs, published the results in two books and established himself as a pioneer of the rapidly growing field of research called "canine cognition," which is revealing new insights about the often-enigmatic behaviors of our fabulous furry four-legged friends.

Today there are Canine Cognition labs at Yale, Duke, University of Arizona, University of Portsmouth, Barnard College, University of Florida and a wide array of leading scientific institutions around the globe—and the study of dogs in general is one of the fastest growing areas in the broader field of animal behavioral science. A new international consortium called the ManyDogs Project, with researchers in Austria, Poland, Italy, Canada, the U.S., Argentina and a number of other countries, recently completed its first major collaborative study and plans to publish it later this year.

The insights emerging are confirming things many dogs owners have long suspected and are fundamentally changing what scientists thought they knew about dogs. Far from being dumb creatures with good noses, as previously thought, they're actually smart in specific ways that make them ideal human collaborators and companions. Over the millennia, they have evolved to be cooperative animals, endowed with the neural machinery to understand abstract ideas and complex social dynamics. They're able to read and assess human emotions with great accuracy, can understand some language and are even capable of making rudimentary signals.

The new dog science is also addressing the issue most prominently on the minds of Bern and dog owners everywhere: Does my dog really love me?

IT'S THE DOG'S DAY The study of dogs has ballooned into one of the fastest growing areas in the more general field of animal behavioral science.



FROM LEFT: FLASHPOP/GETTY; CHAD LATTA/GETTY

Dogs Are No Dummies

HUMANS HAVE BEEN DOMESTICATING DOGS FOR AT least 32,000 years—more than 10,000 years longer than horses. Today the U.S. alone is home to an estimated 90 million pooches (roughly one for every four Americans), many of whom have owners who treat


"DOGS ARE SMART ENOUGH TO SURVIVE IN A HUMAN FAMILY, WHICH IS ACTUALLY A QUITE COMPLICATED TASK."



them like mini people, dressing them in raincoats, sweaters and booties (the global pet clothing market topped $5.2 billion in 2021). They confide their deepest secrets, rearrange vacation schedules to accommodate their idiosyncrasies and shower them with gifts and luxuries such as dog houses and rawhide.

Scientists who study animals have tended to turn their noses up at dog cognition. This attitude was driven in part by the mistaken belief that domestication had dumbed dogs down. In a famous 1985 experiment, University of Michigan researchers found that wolves could unlock a gate mechanism after watching a human do so, but domesticated dogs didn't seem to get it. The implication was that the dogs were stupid.

All that changed in the late 1990s and early 2000s, thanks to a series of groundbreaking experiments by ethnographers Vilmos Csányi and Ádám Miklósi and their collaborators at Budapest's Eötvös Loránd University.

Csányi and his wife were hiking one winter in the Hungarian mountains and stopped to pet a particularly gregarious stray. The dog followed them for five miles through the snow before Csányi picked him up and carried him the rest of the way home. Flip, as they called him, was white and brown and had stumpy legs and resembled an Ewok, a cute furry biped from *Star Wars.* Flip quickly became an indispensable member of the household and won over all their friends and family. What was it about this "fuzzy male of low stature, surely a mixed breed," Csányi wondered, that made him so magnetic?

Flip seemed to be living proof that the conventional wisdom about dogs—that they were unintelligent—was wrong. The ability of canines to insinuate themselves successfully into the lives of their human owners seemed like an amazing feat of evolutionary magic. "Dogs are smart enough to survive in a human family, which is actually a quite complicated task," recalls Miklósi. "Wolves can't do that. Establishing a specific social relationship with another species is quite challenging."

Csányi and Miklósi decided to examine the process by which humans and dogs forge strong emotional bonds. As ethologists, they were familiar with the extensive scientific literature on "attachment," the process by which parents and children of different species formed lasting emotional bonds.

"IF WE'RE TALKING ABOUT SOCIAL INTELLIGENCE, DOGS ARE VERY HUMAN-LIKE IN THE WAY THAT THEY REASON ABOUT THE SOCIAL WORLD."

Human owners and their dogs, they theorized, formed bonds in the same way—growing close through a process that mimicked that of a human parent and child.

Their theory was inspired in part by Flip's behavior at home, which struck Csányi as uncannily familiar. "When my children were 2 or 3 years old, they wanted all of my attention. They wanted to touch me, they wanted me to touch them," he recalls. Flip's behavior was "very similar."

In an early experiment, Miklósi and Csányi placed dogs and their owners in an unfamiliar room with interesting things to explore and took

FROM LEFT: SENSORSPOT/GETTY; FLASHPOP/GETTY

PAIR BONDING
Dogs have a facial muscle that allows them to widen their eyes like babies. Left: A maltese bichon. Below: Terrier (right) and human.

notes. The dogs and their owners exhibited behaviors virtually identical to what developmental psychologists had long observed in well-adjusted human infants and their mothers. The dogs used the owners as a secure base, venturing out and coming back as they explored the new surroundings, all the while staying connected through eye contact and watching carefully for cues. The implication was clear: Dogs had hacked the human system designed to respond to cuteness and bonding.

In recent years, scientists have extended this line of research. When a dog and a human are bonded, each touch and each bit of eye contact causes their bodies to release the powerful hormone oxytocin—the "love chemical" that also promotes bonding between mother and child and is known to lower heart rate and blood pressure. Petting increases levels of the hormone dopamine, sometimes referred to as a feel-good chemical, and endorphins in both dogs and humans.

Other studies have found that dogs have evolved two to three times as many fast-twitch facial muscles as wolves, which gives them greater latitude for expression. A special facial muscle allows them to widen their eyes in ways that way human babies do, eliciting the same high-pitched voices and facial expressions that parents use with infants. Dogs at shelters that are better at making these "puppy-dog" eyes are more successful at finding new homes. Dogs given oxytocin, meanwhile, tend to gaze at their owners more, which causes the owners to look back, setting off a virtuous cycle of more oxytocin and dopamine release and bonding.

The ability of dogs to bond with members of other species is not limited to humans, as any dog owner who also has a cat will tell you. In his 2005 book, *If Dogs Could Talk,* Csányi describes a dachshund-like canine named Jumpy whose owners frequently cooked rabbit stew, a delicacy Jumpy enjoyed for years. Then, one Easter, they obtained a live rabbit who temporarily became Jumpy's favorite playmate. When they turned that rabbit into stew, not only did Jumpy recognize and refuse to eat his new friend, but he went on a "silent and dejected hunger strike for three days," Csányi wrote. Jumpy has refused to eat rabbit meat ever since.



Social Intelligence

IT'S NOT JUST THAT DOGS ARE SO CUTE WE CAN'T RESIST them. Research has also confirmed that dogs are hardwired for cooperation and friendship, remarkably attuned to our emotions and limitations and, it seems increasingly clear, capable of learning and remembering complex rituals and information.

For his part, Csányi immediately noticed how quickly Flip seemed to grasp and adapt to the rules of the house. The Csányi home was crammed full of small objects. Although Flip was energetic and "prone to excitement," he never knocked anything over or broke anything. When Csányi commanded Flip to fetch an object from a table—say, a ball or a toy—he invariably grabbed it with "exquisite care." And if, in the process, anything else had been accidently moved, he would "immediately stop and ask for help by looking at me or barking."

This type of behavior led Csányi and Miklósi to question the iconic Michigan experiment comparing the intelligence of domestic dogs and wolves. Perhaps the dogs had been able to open the gate mechanism after watching humans do it. Maybe they just didn't want to break the rules.

Csányi and Miklósi recruited 28 dogs and their owners and set up a complicated contraption that required dogs to pull on the handles of plastic dishes on the other side of a wire fence to obtain meat.





KELLY/NOBLE SOUL PHOTOGRAPHY/GETTY

"IT'S A CHALLENGE TO FIGURE OUT HOW DOGS THINK AND WHAT THE WORLD IS LIKE TO THEM,

Outdoor dogs, who spend most of their time in the yard and thus are presumably more accustomed to acting as independent agents, outscored their indoor cousins about a third of the time, while the most obedient domesticated dogs looked to their owners for permission to reach through the fence. When they got it, however, they matched the performance of their more independent cousins.

To figure out how much the dogs could understand, the experimenters hid food in one of several containers, then brought the dogs into the room and had them guess which container had the food. To help them, researchers offered various cues, alternatively staring at, nodding toward or pointing to the correct container. When researchers use these tests on human infants, they quickly catch on to the hints. Apes and chimpanzees, by contrast, almost never do without extensive training. Dogs, like toddlers, are quick learners. They soon learn to heed the pointing, bowing, nodding, head turning and glancing gestures from humans to find the hidden food.

SMARTER THAN CHIMPS Dogs have the brainpower to ascribe motivations to people. Left to right: Dobermann, border collie, English bulldog, chihuahua.

The pointing experiments provided the first direct evidence that dogs have the brainpower not only to understand abstract ideas, but also to ascribe motivations to members of an entirely different species, according to Evan MacLean, an evolutionary biologist and cognitive scientist who is the founder and director of the Arizona Canine Cognition Center. It also suggested that studying dogs could give us insight into sociability and what allowed humans to be so successful.

"If you think about it, pointing is a fundamentally cooperative kind of behavior," MacLean explains. "If I point out something for you, as a human, when you're trying to figure out what that means, you without thinking about it assume that I have a cooperative motive. I know something about the world that you don't, and the reason I'm doing this is because I want to help you in some way. That is cooperative behavior at its core. Other animals can't do that."

Dogs pay close attention not just to human gestures, but to human facial expressions as well. In

FROM LEFT: SENSORSPOT/GETTY; CHAD LATTA/GETTY; SENSORSPOT/GETTY; TIFFANY





BECAUSE THEY HAVE EVOLVED TO MAKE US THINK THAT THEY ARE LIKE US."

recent years, researchers have shown that dogs can distinguish expressions of happiness, anger and disgust. They can tell when a person is sad or cheerful. Their hearts beat faster when they see photos of expressive faces than neutral ones. They avoid angry faces and pay more attention to fearful ones.

All this helps explain why guide dogs are so effective at helping blind people navigate the world and avoid stepping into traffic and how therapy dogs can comfort traumatized children, prisoners serving life sentences for violent crimes, senior citizens fading into dementia and stressed-out college students cramming for exams: because they can read human emotions and respond appropriately.

Good Judges of Character

EVIDENCE IS GROWING THAT DOG SMARTS ARE NOT limited to social and emotional intelligence. It apparently extends to far more complex behavior as well.

Dogs are capable of making rapid, simultaneous judgements of the kindness or potential helpfulness of humans they meet—just as Flip apparently did when he decided to adopt Csányi and his wife on that Hungarian mountaintop. They also seem to be capable of accumulating sophisticated mental files on individual people and using that information to guide behavior.

In humans, the ability to evaluate character is foundational, emerging as early as five months. Zachary Silver, who recently earned his Ph.D. at Yale and will soon open a lab at Occidental College, recently used pairs of actors to test the ability of dogs to make character judgments. One actor would pretend to steal a clipboard or actively harm somebody else, while the other would be friendlier, handing someone a clipboard they are looking for. Both actors would then simultaneously offer the dog a treat. Of 37 dogs tested, two thirds preferred to take food from the friendly actor. Other experiments have found that dogs will eventually stop following cues from human individuals who too often mislead them.

"If we're talking about social intelligence, dogs



FROM LEFT: PM IMAGES/GETTY; FLASHPOP/GETTY

are very human-like in the way that they reason about the social world," says Silver.

Of course, dog owners have already figured this out. For instance, most people who have shy dogs know that their pets often watch their interactions with strangers closely and are more likely to make a friendly approach to someone after seeing their owner have a positive interaction. Yet they seem to understand the relationship is different—they never seem to want or expect to follow home human friends, no matter how familiar and beloved, if those friends don't reside with their primary caregivers.

With dogs, communication goes both ways. In a revised version of the pointing experiment, owners would leave the room while researchers hid food in plain sight of the dogs. Typically, when an owner returned and was asked to look for the food, the dog tried to signal by running back and forth between the hiding place and the owner or using their eyes to indicate the location.

The eagerness of dogs to help their owners was brought home to Csányi one day when he took a bad fall on an icy staircase. Flip ran to his side, licked him and stayed with him until he could get up. For years afterward, whenever they came to the same icy steps, Flip would return to his owner's side and closely watch him until they had passed the danger zone. During the summer, however, Flip seemed to recognize the danger was absent.

Barking is another effective avenue of expression. In an experiment with Hungarian mudis, a herding dog that resembles German shepherds and border collies, Miklósi recorded the dogs while playing with other dogs, anticipating food, encountering an intruder and several other situations. When he played the recordings to volunteers and asked them to guess the situation, owners and nonowners alike were right about a third of the time—about twice the rate of chance.

"When dogs are vocalizing, they're really expressing different kinds of inner states," Milóski says. "They try to communicate something about their emotions."

Dogs seem to have a big capacity to learn new ways of expressing themselves. Miklósi has shown that with just a little bit of training, dogs can be enticed to mimic a wide range of human actions spontaneously, such as bowing, jumping, lifting a limb, turning in circles—even learning to operate a machine that dispenses balls.



THE MIND OF DOG The question of how much dogs can understand—and why some dogs understand more than others—is one of the hottest areas of current research. Left: Jack Russell terrier. Above: Pug.

> **"DIFFERENT BREEDS OF DOGS HAVE BRAINS THAT ARE SORT OF PRE-WIRED TO EXCEL IN DIFFERENT AREAS."**

The Limits of 'Genius' Dogs

A SHEEPADOODLE NAMED BUNNY HAS RECENTLY attracted eight million followers on TikTok for her apparent mastery of language. (A sheepadoodle is a mix of old English sheepdog and poodle.) Bunny seems to express her needs and wants by pressing buttons on a mat, originally designed to help children with difficulty communicating, linked to specific words, such as "walk." Researchers at U.C. San Diego are currently evaluating the claims and studying the extent to which nonhumans can use these tools to communicate.

It sounds like a silly TikTok thing, but the question of how much dogs can understand—and why some dogs understand more than others—is one

of the hottest areas of current research.

It started a decade or so ago with the discovery of a border collie named Chaser that was extraordinarily smart. John Pilley, a behavioral psychologist at Wofford College in South Carolina, trained Chaser to identify and retrieve 1,022 toys by name (he wrote it all up in his 2013 *New York Times* bestseller *Chaser: Unlocking the Genius of the Dog Who Knows a Thousand Words)*. Chaser was also able to discriminate verbs used to describe a desired action—such as "pull" or "fetch." When asked to fetch a specific toy Chaser had never heard of, the dog was also capable of inferring which toy the experimenter wanted if it knew the names of all the other toys present, presumably by a process of elimination.

"POINTING IS A FUNDAMENTALLY COOPERATIVE KIND OF BEHAVIOR. OTHER ANIMALS CAN'T DO THAT."

Chaser kick-started a quest among some researchers to find more examples of "genius dogs" to study. In 2021, Miklósi, set up a website to find smart dogs (he's still seeking candidates) and launched a high-profile "genius dog" contest that was covered by CNN and other media outlets during the pandemic, pitting dogs with big vocabularies against one another. So far, he has identified 40 dogs from around the world. Whereas the average dog may know the names of one or two objects, a genius dog will know four to six names and can quickly learn 80 to 100 with training. It usually takes 10 or 15 minutes to learn the name of one object and the dogs retain them memory for about a month. The "cognitive trick" by which they are learning remains an active area of exploration, and to draw conclusions he first needs to recruit more dogs.

Some experts remain skeptical about many claims people make about their dog's abilities. Amritha Mallikarjun, a postdoc at Penn Vet Working Dog Center at the University of Pennsylvania, which specializes in training and studying search-and-rescue dogs, bomb sniffers and other service dogs, says that, in general, people tend to overestimate the capacity of dogs to understand speech. Miklósi admits that only an extremely small percentage of dogs are capable of learning 100 words or more.

Dogs may never recite Shakespeare, but they do seem to have an affinity for different languages. Mallikarjun has demonstrated that dogs raised in English-speaking households show far more interest when people speak in Spanish (and vice versa), because, she thinks, it is novel to them. "They can certainly learn the idea that a spoken utterance corresponds with an action or an item, but they cannot speak language" in a technical sense, says Mallikarjun. In most cases, dogs understand the tone, and often can figure out the meaning of words by the context. But most dogs can't actually distinguish between nouns and verbs without cues.

"I can certainly train a dog to step on a button if they want to go outside," she says. "I can also train a dog to ring a bell if they want to go outside, which is what a lot of people have already done. Or you just wait until your dog comes over to you. Because generally we understand our dogs pretty well. Chaser was the only dog thus far that's basically been able to show the idea that there's an action that can go with an object, and they're separate."

Inside the Doggie Brain

AS BRAIN IMAGING TECHNOLOGIES CONTINUE TO ADvance, they're offering tantalizing clues about what goes on in canine brains. Dogs, research shows, see the world in radically different ways than people do.

Philippa Johnson, an associate professor of diagnostic imagining at Cornell College of Veterinary Medicine, recently produced the first atlas of the canine brain. She's found that the temporal areas of the brain—those involved in long-term episodic memory and emotions—are roughly comparable in dogs to those of humans. This explains how dogs bond so well with humans and understand emotions. However, a dog's frontal cortex—the seat of abstract reasoning, problem solving and imaginative thought—is far smaller than that found in humans. To Johnson, this suggests dogs are "much more present" than humans, blissfully immune to worrying about what will happen beyond the next meal or cuddle.

However, other areas of the brain are far larger in

GALLERY OF CUTENESS
Clockwise from top left: American pit bull; mastiff; miniature pinscher puppy; mixed breed.

CLOCKWISE FROM TOP LEFT: SENSORSPOT/GETTY; CHAD LATTA/GETTY; SENSORSPOT/GETTY (2)






dogs than in humans. These include those involved in visual processing, fine-motor function and smell. Johnson has also done extensive work mapping the "white matter" connections in the canine brain, which sheds light on what areas most often work in tandem.

Perhaps most notably, she has identified a major track in dogs that is not present in humans. It provides a direct connection between the visual cortex and the olfactory lobes, involved in processing smells. She's also found direct connections, not found in any other species, between the nose and the spinal cord. An odor entering a dog's nose will sometimes be processed in the visual areas of the brain, which is why some blind dogs seem to retain some ability to "see." More broadly, this means that the moment-to-moment experience of a dog probably involves an intricate interweaving of sights and odors.

Indeed, if dogs have a superpower, aside from social cognition, it would be their sense of smell. A dog's nose is a million times more sensitive than that of a human. The average person is equipped with five million olfactory receptors—tiny proteins capable of detecting individual odor molecules—clustered in a small area in the back of the nasal cavity. By contrast, the average dog has 300 million olfactory receptors—60 times more than humans—extending from the nostrils all the way to the back of the throat. By some estimates 35 percent of a dog's brain is dedicated to smelling, compared to 5 percent for humans.

That's why dogs have been used for centuries to sniff out outlaws, explosives and drugs, find avalanche victims and rescue individuals trapped under buildings. In recent years, they've even been trained to sniff out cancer and COVID-19. Clara Wilson, an expert on canine olfaction at the Penn Working Dog group, found that dogs can smell human stress. In experiments, a dog presented with a piece of cloth swabbed from the back of a person's neck and breathed on can usually tell whether or not that person had recently been asked to perform a difficult math task.

Dogs, Wilson notes, also use their sense of smell to keep track of time. They can tell the difference between an odor that's 12 hours old or four hours old. That's how they know when it's time to go out for a walk and when their owner is due home from work. Often, on walks, they are sniffing out urine from other dogs, which contains copious amounts of information, such as whether a dog was in heat, stressed out, happy or sick.

One study found that small adult male dogs tended to pee higher relative to their body size than larger adult male dogs to exaggerate their height and competitive ability. In another study, researchers showed dogs pictures of other dogs whose pee they'd sniffed. The dogs who sniffed the pee were surprised if the size of the dog in the picture did not conform to the mental image in their head, Wilson says. There's so much information in pee that Wilson and her colleagues refer to it as the "pee-mail" system. A dog will often pee its reply on the same spot.

There is, of course, a wide variability between one dog's brain and another's. Erin Hecht, head of the Evolutionary Neuroscience Laboratory and the Canine Brains project at Harvard, has been studying how human breeding has affected canine brain development. In research published in 2019, she looked at 62 pure-bred dogs from 33 different breeds and found substantial differences in the sizes of different brain regions and networks, depending on whether they had been bred for hunting, herding, guarding or companionship.

One network included reward regions of the brain that would be involved in social bonding to

"WHEN PEOPLE WANT TO KNOW 'WHAT IS MY DOG THINKING,'



FROM LEFT: FLASHPOP/GETTY; SENSORSPOT/GETTY

humans, training and skill learning. These regions would be more pronounced in companion "lapdog" breeds, such as the Maltese and Yorkshire terrier. A second network, associated with active smelling and tasting in pursuit of a goal, was larger in scent hunters, such as beagles and basset hounds. A third set of areas—used for eye movement, vision, spatial navigation and motor areas involved in moving through a physical environment—was larger in dogs bred for sight hunting, such as whippets and Weimaraners.

A fourth network included high-order brain regions that might be involved in social action and interaction, including areas that appear to be activated when dogs are presented with human faces and vocalizations, which was also linked to companion breeds like the Maltese and Yorkshire terrier. A fifth set of regions involved in fear, stress and anxiety, which regulate behavioral and hormonal responses to environmental stressors and threats, was well developed in breeds historically used for fighting, including boxers and bulldogs. And a sixth network, involved in processing smell and vision, was linked to dogs with historical police and military functions like boxers and Doberman pinchers.



I THINK WHAT THEY'RE ASKING IS, 'DOES MY DOG LOVE ME?'. THE ANSWER IS 'ABSOLUTELY.'"

"There's way more variation across dog brains than there is across any other species," she says. "And so this is the result of human breeding. We have made them this way, and different breeds of dogs have brains that are sort of prewired to excel in different areas."

"It's a challenge to figure out how dogs think and what the world is like to them, because they have evolved to make us think that they are like us," she adds. "They've evolved to mimic human psychology in some ways. That doesn't necessarily mean that that's actually what's happening in their brains. We have to try to take off our human color glasses to understand what's going on with them, and that's hard for us to do."

Does My Dog Love Me?

ALL THE RESEARCH FINDINGS IN THE WORLD ABOUT how much dogs understand language, read human intent and are keen judges of character did not satisfy Gregory Berns. He still sought an answer to his Big Question about Newton. When his beloved pug looked up at him with those puppy-dog eyes, was it true love?

Since Newton had already crossed the Rainbow Bridge, Berns turned his attention to Newton's successor, a pet terrier named Callie. He trained Callie to lie still in an fMRI scanner. Berns fed her, praised her and left her alone in the huge donut-shaped machine and monitored the reward areas of her brain to see when they lit up the most.

The results were unambiguous: kind words from Berns lit up Callie's reward centers just as much as the dog treats, demonstrating that Callie—and by extension, Newton—loved him just as much, if not more, than a scrumptious piece of food.

"When people want to know 'what is my dog thinking,' I think what they're asking is, 'does my dog love me? I love him,'" Berns says. "The answer is 'absolutely.' It's remarkably similar to how we experience the relationship. They have these social bonds that with us, that they find them intensely rewarding." Science, in this case, is telling us what we already knew.

LET THERE BE LIGHT
Praise lights up the reward centers of a dog's brain. Left: A fluffy dog with its human. Top: Pit bull.

PUPPY LOVE

We asked readers to send us their funniest, sweetest and most adorable photos of their pooches and tell us why they love them so much. Here's a sampling of the responses. →



Buddy

BRETT GURSKY

"I love my dog like he's my son. He's the sweetest, funniest, happiest, most loyal dog. Every moment with him is filled with laughter & fun."



Cheyenne

WENDY RICHARD

"My 9-year-old Dogue de Majorque is adorable, protective, lovely and dedicated to her family. We are blessed to have her by our side."





Mia & Bimba

JUAN PABLO MOLINA

"Mia, a pitbull, and Bimba, a springer spaniel are our two pets. Unconditional love, that's just it."





Mocha & Latte

DARLENE BERGANO

(Photos are before and after "fun in the mud.") "Momma wanted to name us Mocha and Latte. So we tried to look like a Mocha and Latte."



Mona

LAURA VAZQUEZ

"She is full of life and energy, the ultimate curious explorer, a sweet and funny companion. She has the biggest personality for a six-month-old pup."



Peach

KATIE COSTELLO

"Peach loves every dog and cat she's ever met, rests mid-walk whenever and wherever she feels like it and snuggles by laying fully on you."



Bodie

ALEXANDRIA BACKUS

"Bodie is the biggest goofball. Seeing his mischevious face makes any day better! He got me through COVID and a very difficult time in my life."





Katsu & Chestnut

WENG GOMEZ

"I never imagined dogs could make me feel so loved. While everyone is busy with their lives, they are there, ready for a hug to make me feel better."



Max

MICHAL LECHOWICZ

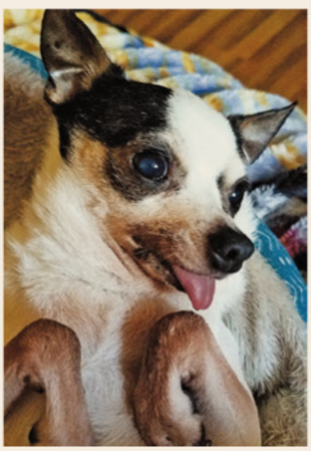
"He's a total couch potato—8 a.m. is too early to go outside, prince must sleep to 10-11. Not friendly for foreigners but for family is a big Winnie the Pooh."



Lucy

ROGER RINEHART

"Lucy is the perfect companion for our empty-nesting years. Her greatest joy is hanging out. She encourages us to take walks and never met a stranger."



Spike

"YAQUIGIRL AMERICAN"

"Spike is a rescue and has been my buddy ever since. He is the boss."



Stax

J. BENEDICT, K. WALLMAN

"When we stop petting Stax he starts whining. He always greets us and others with a toy in his mouth. We love him for all his quirks!"



Sweet Pea

MIKI PHAGAN

"Sweet Pea, 13, is quite a curmudgeon but so protective of our granddaughter, 15 months. He watches over her—an old man found new purpose."



Travis

SANDRA SWIETLIK

"Travis loves people almost more than anything. Cheese will forever be his first love. He makes me cry, laugh, rejoice and feel so loved."

ALL PUP PHOTOS COURTESY OF THEIR PARENTS



COURTESY OF PRIME MINISTER'S OFFICE, BHUTAN

Bal

BHUTAN'S PRIME MINISTER DISCUSSES HOW THE CARBON-NEGATIVE KINGDOM DEALS WITH CLIMATE CHANGE AND A GROWING RIVALRY BETWEEN NEIGHBORS INDIA AND CHINA

An Intricate ancing Act

by

DANISH MANZOOR BHAT



"I ONLY WISH GREENHOUSE GASES NEEDED visas and passports," Bhutan's Prime Minister Lotay Tshering lamented to *Newsweek* in an interview in the highest country on earth.

Mountainous and heavily forested Bhutan has been called the first carbon negative country, meaning that it takes in more of the carbon dioxide that fuels global warming than its limited industry pumps out. But its location in the Himalayas exposes it all the more to the impact of climate change resulting from the emissions of other countries.

While low-lying nations are often seen as early victims of climate change as a result of rising seas, in Bhutan it is the accelerating pace with which glaciers are melting that is a problem. The lakes they are feeding threaten to burst and cause flash flooding that can be catastrophic for Bhutan's people and its agriculture. Steep slopes in the country, which has an average altitude of nearly 11,000 feet, make it prone to landslides during heavy rainfall—with the instability potentially exacerbated by earthquakes.

"We are challenged with a lot of natural disasters that come in and surprise us," Tshering said.

The Full Interview
Scan the QR code below to access the video version of* Newsweek*'s conversation with Bhutan Prime Minister Lotay Tshering.

The natural elements are far from the only challenges in Bhutan, which faces one of the most intricate geopolitical balancing acts anywhere given its location sandwiched between the world's most populous countries—and increasing rivals—India to the south and China to the north.

Friendly with India, with which it does well over 80 percent of its trade, Bhutan is locked in border negotiations with China, which claims a swathe of the country of about 775,000 people—a little more than the population of Seattle. Although Bhutan has no formal ties with the United States, the U.S. State Department says the two countries have warm, informal relations.

Ever diplomatic in his language, Tshering said, "I think how peaceful we are, and the kind of society we have is not something that we alone built up. It's our neighbors who helped us build it. It's our neighbors who help us stay the way we are, and it is our neighbors' goodwill that has resulted in where we are today."

The Buddhist kingdom is the home of the world's youngest monarch, 43-year-old Jigme

> "WE ARE NOT OBLIGATED TO REMAIN CARBON NEGATIVE BUT WE GENUINELY FEEL THIS IS THE RIGHT WAY FORWARD. BEING CARBON NEGATIVE IS OUR WEALTH."

Khesar Namgyel Wangchuck, and is run by Tshering, who at 53 still finds time to practice medicine as a kidney doctor. On weekends and some weekdays, he can be found conducting surgeries at the Jigme Dorji Wangchuck National Referral Hospital in the capital, Thimphu.

Tshering has said one inspiration for his work was the late Roman Catholic nun Mother Teresa, known for her charitable works and now canonised as a saint. He is also married to a doctor.

Tshering was elected in 2018. Well-known nationally, in part for his appearances to give advice as a doctor on television, Tshering entered politics only around five years earlier, paying back his training fees when he resigned as a civil servant and saying he would try to fix Bhutan's systemic problems and not only those of individual patients.

Despite its challenges, Bhutan has long been committed to prioritizing what it calls Gross National Happiness (GNH) over Gross Domestic Product (GDP)—a concept that Tshering spoke about, among other topics, with Danish Manzoor Bhat, Editorial Director, Asia of *Newsweek*. Their conversation has been lightly edited for clarity.

Q: ***Prime Minister, if I ask you to define the relationship that Bhutan shares with three countries; India, the United States of America and China, how would you respond?***

A: I don't think one country can do without being dependent on others, forget being neighbors. Now you've given me three countries, the United States of America, India and China. We are physically between India and China. So, we have a lot of advantages to take from our two neighbors and these two neighbors are the most populated in the world. Two neighbors whose economies are growing at an unprecedented pace. So, we take lot of pride and excitement in it.

The United States of America is also "the" economy right now and leader in the world global power, and we have lot of goodwill with all Americans and the government of America and the leadership there. So, I think it's a win-win situation. For us, it will be very difficult to pick one from the three. And for that matter, genuinely, it is wrong to pick one from all good neighbors or good countries in the world. So, they are all good for us.

Q: ***Prime Minister, Bhutan is landlocked. You've got India on one side and China on the other. Yet your country has been able to stay out of trouble. How do you achieve it?***

See, it all depends. How tall you are, depends on how short your neighbors and friends are. How short you are, depends on how tall your friends are. I think how peaceful we are, and the kind of society we have is not something that we alone built up. It's our neighbors who helped us build it. It's our neighbors who help us stay the way we are, and it is our neighbors' goodwill that has resulted in where we are today. I think being landlocked can be disadvantageous and at the same time, advantageous. So, I'm happy to share with you that we are on the side of advantages. It's a huge advantage for us and knowing the fact that we are packed between two most fastest growing economies in the world. We are positioned in the most advantageous way.

PROTECT AND SERVE
Opposite: Nearly 75 percent of Bhutan is covered by protected national forest. Below: the Prime Minister (here, performing surgery) is also a practicing doctor.



FROM TOP: LYNSEY ADDARIO/GETTY; COURTESY OF PRIME MINISTER'S OFFICE, BHUTAN

Q: ***We see your amicable relations with India, but China is now claiming almost 10 percent of Bhutan's territory. Where do you see that going?***

A: We have very good relations with India historically and geographically. And I was very happy to have Indian Prime Minister [Narendra] Modi visit us as the first country after elections, and I also reciprocated being in New Delhi as my first destination after elections. This relationship should go on forever. We do not worry whichever government comes to power in Delhi, whichever government comes to power in Thimphu, the relationship between the two countries will go on forever and that is something that we all take for sure.

And I'm very happy to share that, with China, we have friendly relations. As boundary talks have progressed very smoothly, we had the technical level of visits from Thimphu to China a month back and the progress was very good. The next stage will be their technical team coming to Thimphu and then sorting out whatever timeline that we have agreed upon in China. And then after that is to physically demarcate the boundary between the two countries. I don't think there are any two countries in the world that are resolving the boundary demarcation in such a timely manner as Bhutan and China are. A lot of credit for this of course goes to my predecessors, His Majesties the Kings, but a bigger share goes to the bigger neighbors, to their positive thinking towards us, their friendly feeling for us, and their genuine goodwill gestures. I'm grateful to all of them.

Q: ***Prime Minister, the biggest conversation around Bhutan has always been climate change. As this country is intrinsically carbon negative, what is the message that you have for the world?***

A: I mean, when you talk about climate change in Bhutan, it rightly stands out for many individuals and countries in the world who are very climate sensitive. I think I've taken note of this, that Bhutan, is being naturally carbon negative when the whole world is trying to become carbon neutral by 2050. Many countries in the world can never be carbon negative, but we are. Thanks to my predecessors and His Majesties the Kings. If you go through our constitution, it mandates us to spare at least 60 percent of the country under forest cover. I don't know how many constitutions in the world have this vision. We have been preserving our pristine environment for generations. Yes. I also admit that when the whole world was getting industrialized, we did not, and we could not. So, if we had industrialized like any other nation in the world, would we have been carbon negative today? I doubt. But thank God that we did not or could not industrialize. That's why we remained poor for a little longer. But now we have the richness that no other nation has—72 percent of Bhutan is under forest cover.

What will we do in the future? We have already committed to the U.N. and all climate bodies and

"THE WORLD KNOWS US THROUGH THE CONCEPT OF GROSS NATIONAL HAPPINESS. WE GO AROUND BEING VERY HAPPY, COMING FROM A PLACE THAT IS PEACEFUL."







FROM TOP: PAULA BRONSTEIN/GETTY; SAJJAD HUSSAIN/AFP/GETTY; ARUN SANKAR/AFP/GETTY



have pledged to keep the country as green as we have now forever. The 72 percent of the country under forest cover is again further protected as national parks, biological corridors, biodiversity hotspots and we have legal instruments in place to protect them forever—at certain places, even at the cost of some inhabitants. Some rural villages have ancestrally been living there and they're at a little disadvantage. We are looking for ways and means to support them or if possible, to even relocate them. So that they will also be contributing not just to Bhutan, but to the whole world.

At this time, I only wish greenhouse gases needed visas and passports to cross international boundaries. Greenhouse gases emitted elsewhere on this planet are affecting us. Being resource constrained, adaptability is very important. Our resilience has also been threatened. We are challenged with a lot of natural disasters that come in and surprise us. This is part and parcel of life, but we are genuine, we are determined that we will remain like this.

The biggest threat to our carbon negativity is the emission from cars. We have a National Program on introducing more electric vehicles now. Let us see how far we can go in attempting to add 60–70 percent electrically powered cars on our roads and replace petrol/diesel ones. We are also exploring hydrogen technology that is evolving very fast. I would like to focus more on and invest more in that.

We are not obligated to remain carbon negative; we can do what we want to do. But we genuinely feel that this is the right way forward. Being carbon negative is our wealth.

In the whole world, a lot of money, a lot of resources are being pumped into reducing greenhouse gas emissions and reducing the level of emissions so that we bring the whole world to carbon neutrality by 2050. Many big emitters have also

CLIMATE CHALLENGE
Left, from top: Secondhand pollution from neighbors like India (here, smog in New Delhi) is a concern, so Bhutan is investing more in green energy like wind turbines. Above: Novice Buddhist monks practice the flute.

THE **Newsweek** INTERVIEW

pledged. China and India have also pledged. That's very difficult. Pledging that we will be carbon negative forever is a little easier for us than it is for India and China to pledge becoming carbon neutral by 2060 or 2070. That is a bigger commitment.

Q: ***Is GNH or gross national happiness the only indicator that the world should look at when it comes to Bhutan?***

A: The whole world knows us through the concept of gross national happiness. And we also go around being very happy, coming from a place that is a peaceful one. More than us telling the world I think it all depends on the world and what they want to learn from us. So learning is not only by teaching, but by willingness to listen. So, this is very, very subjective. And I for one, ever since I knew myself, do not have the habit of preaching anything. I only go around practicing what I believe in, and then it's up to individuals like yourself to tell the world what we have today.

Q: ***What are the priorities of Bhutan as a nation for its near future?***

A: I don't think any nation can progress or prosper without having a dependable, resilient, robust economy. In Bhutan, we have come up through a unique path, a unique tradition, unique culture, unique environment that resulted us in having carbon negative status today. A unique system which allows us to go around talking about the principles and philosophy of gross national happiness. So, since we have these few unique features that no nation on this planet has, I would like to say Bhutan's future priority is to be rich, to be technologically driven, to have resilient, robust economy but grounded to our unique features. That should make our economy totally different from others.

Q: ***I have noticed while speaking to the locals that education and health care is free for all citizens. So how do you manage that?***

A: Yes, when I said Bhutan has a lot of unique features, "health and education" are among them. His Majesty the King, the successive monarchs, have always believed that the best social equalizers are health and education. We have state-funded free health care and education in the country. We want to give the best of education and keep it free. We want to offer the best of health care and give it to the citizens of the country for free because if you do not have to worry about educating your children, if you do not have to worry when you're sick, that is the first step to prosperity.

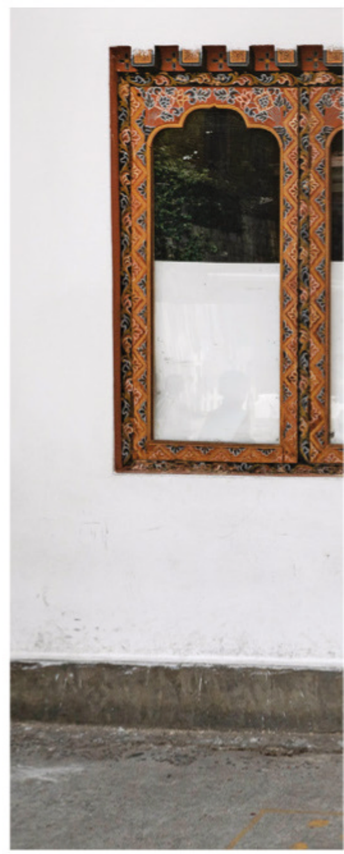


"PARTS OF BHUTAN HAVE BEEN SUFFERING FROM BRAIN

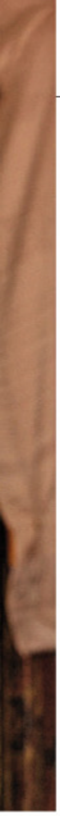
Q: ***Speaking of education; what new initiatives is your government planning to take to ensure that human resource from Bhutan is ready for the world and the technological challenges?***

A: We have realized that technical and vocational training is something that is really required. We have also realized that [the] definition of literacy is changing, we must have digital knowledge. We have started a major shift. We are ICT-izing [Information and Communication Technology] the whole education system, so we must change the curriculum, we have to ITC-ize the teachers, we have to digitalize the infrastructure, and we have to change the mindset of the teachers and the learners. Two years ago, 2020 onwards, we introduced coding system in all the schools. Formal school starts from age five in Bhutan. From pre-primary, a 5-year-old now gets exposed to coding, he or she may not realize but it's there. His Majesty gifted a "code-monkey" system to all the schools. We managed to have ICT labs in all the remote schools.

We would like to have dependable, reliable internet connections, which is a challenge for now, but we will get there. Almost all the schools are now connected with fiberoptics. We would like to digitalize



FROM TOP: TRISTON YEO/GETTY; PAULA BRONSTEIN/GETTY



the content, so the students are able to use it. We are also telling our teachers that they are now no more the source of information. It is already there on your phone. Teachers should now be facilitators between the information and the information seekers. I think we are going through a major revolution in the education system. And again, it will be for free.

Q: ***A lot of skilled youngsters, educated outside of Bhutan, do not want to come back, many are leaving. Do you see that brain drain as a challenge?***

A: For me, it is not a new trend. Parts of Bhutan have been suffering from brain drain for decades. With globalization, there's a similar trend. They're going to places and countries where they have better opportunities.

Is this the challenge for us? Definitely. It will be a disaster for us if we don't change our mindset. His Majesty the King has commanded, initiated, and is now leading major transformation in the country. All public sectors, civil service, financial institutions, central bank, judiciary. Everything's getting transformed because we must meet the expectations of our educated Bhutanese youth. As a result of this transformation, the rate of brain drain will decrease because the Bhutanese people will have opportunities in-house. I don't think there is one single Bhutanese who is going out because they don't like Bhutan. They all love Bhutan, love their motherland. They all love His Majesty the King. But since there are no opportunities as per their expectation, they are going out, leaving their loved ones behind.

Q: ***Are there any specific focus sectors that you are looking to expand in or seek support in?***

A: We are attracting investments at any level possible to invest in Bhutan on renewable energy, hydro-energy and are now focusing more on solar and wind energy also so we can have energy surplus coming from renewable sources.

We would like to focus on agriculture, riding on technology. Same with education. We intend to focus a lot on STEM- [science, technology, engineering and mathematics] subjects, STEM-related education. Humanities have their own requirement, but a majority focus on humanities alone will not take Bhutan forward. On that note, we have been sharing our needs with all the countries in the world, the closest being India. We would welcome help with more STEM-related subjects, trainers, experts, teachers. We are going through a digital transformation. We are almost done with having a "National Digital ID" system for citizens and tourists. That digital ID system being the spine, has a big digital component in health. We call it electronic patient record system so that everything is digitally recorded and will help the country in resource allocation.

In education we have education management systems, learning information management systems, where the milestones will be recorded, subjects that they are inherently good at will be analyzed, so that we can channel them in the right fields.

DRAIN FOR DECADES. IT WILL BE A DISASTER FOR US IF WE DON'T CHANGE OUR MINDSET."



A MODERN KINGDOM
Left: Bhutan's King Jigme Khesar Namgyel Wangchuck on his wedding day in 2011. Below: The country provides free education to all (here, girls play at recess at a school in Thimphu).



UNCHARTED

The Most Scenic Coastlines to See From Above

Memorial Day is the official start to summer—and with it, beach season. There's nothing quite as calming as the sound of the surf and the feel of the sun and sand to transport you to an easier lifestyle, far from everyday pressures. The beach itself is a symbol of happiness that is universally joyful, nostalgic and calming. With the images shot from doorless helicopters in his new book, *Coastal*, Gray Malin tries "to capture these feelings," and says, "I hope my aerial photography continues to bring viewers back to the places they love and motivate[s] them to go to the places they still want to see." From the teal blue waters of Lake Michigan to the white sand beaches of Perth, Australia, here are some of his favorite coastlines to help "make every day a getaway."

La Fontelina Beach Club

CAPRI, ITALY

When I flew over the island of Capri there were very few beaches as it's a rocky island, so it was mesmerizing to see these blue umbrellas staggered on top of the rocks against the deep blue sea. *(See #06 on following spread)*

TOP RIGHT: DIA DIPASUPIL/GETTY

Photographs by GRAY MALIN

Ke Huy Quan Talks Representation
"The more you see, the more you understand, and the less you're afraid of it." ▸ P.48





03

Charlevoix Channel Ferry

MICHIGAN

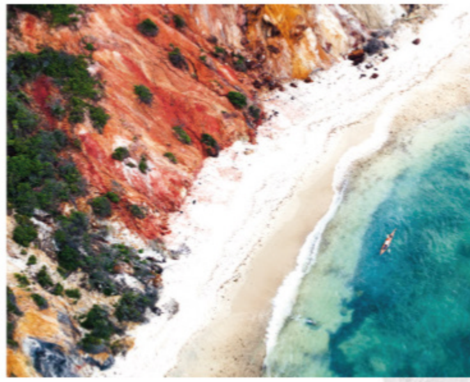
I grew up spending my summers on Lake Michigan and have a lifelong connection to the Midwest. The stunning teal water of the Great Lakes and the sweeping sand dunes are this area's best kept secret.

04

Aquinnah Beach

MARTHA'S VINEYARD

For a relatively small island, Martha's Vineyard is extremely rich in history as well as chock-full of fun "must-sees and dos." Don't miss Aquinnah Beach, famous for its red cliffs. And wherever you end up, be sure to eat a lot of the local catch and enjoy this beautiful slice of American heaven.



01

Surfing Waikiki

HAWAII

The beauty of the Hawaiian Islands is beyond comparison; there is such a serene, relaxing energy there. I visit as often as I can to breathe the fresh air, recharge and reconnect. Hawaii really embodies the same spirit I try to evoke in my work—to make every day a getaway.





02

Bixby Bridge

BIG SUR, NORTHERN CALIFORNIA

The ultimate road trip along California's Pacific Coast Highway must include a drive through Big Sur National Park. There is a celestial energy along the coastline near Bixby Bridge that is contagious and provides long-lasting memories for all who visit.

05

Joatinga Beach

RIO DE JANEIRO

Rio de Janeiro has a beach culture unlike any city I have ever visited. Locals spend sunrise to sunset thriving under the sun. It's part of their Brazilian identity—a way of life.





08

Dubai Beach Club

DUBAI, UNITED ARAB EMIRATES

The beaches of Dubai are very difficult to access by air, so I consider myself incredibly lucky to have had the opportunity to capture their beauty and share the experience through my photography. I have seen so many fabulous umbrellas in my lifetime, but I have never seen any like these, reminiscent of puffs of meringues.

06

La Fontelina Beach Club

CAPRI, ITALY

(See previous spread)



07

King's Bath

CAPE TOWN, SOUTH AFRICA

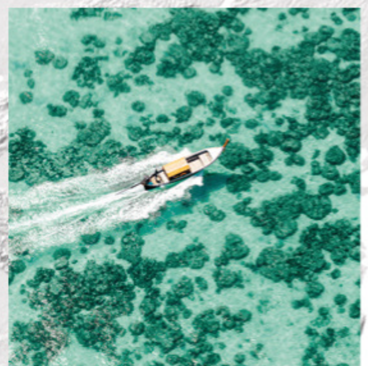
There are so many sides to Cape Town. It is exquisitely stunning yet rugged. The coastline is enhanced by many natural pools that the locals use for swimming since the ocean water can be quite cold. From above, these pools look dazzling set against the crashing waves and earthy tones of the rock formations.

09

Phang Nga Bay

PHUKET, THAILAND

Visiting some of the most beloved beaches in Phuket requires a boat to gain access to the islands. One of the most popular areas to visit by boat is Phang Nga Bay National Park, a geological wonder filled with islets, sunken caverns and startling rock formations made of limestone that rise vertically out of the water.

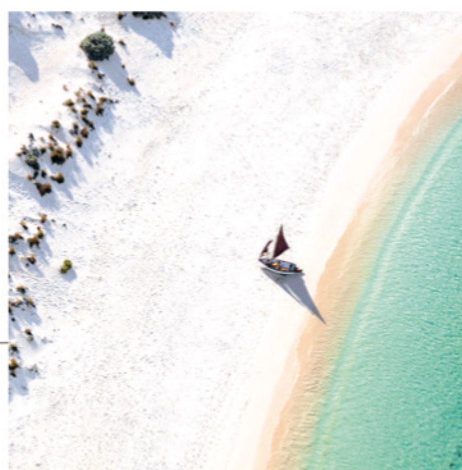


10

Rottnest Island

PERTH, AUSTRALIA

The land down under is one of the most memorable and remarkable places I have ever been—especially the natural beauty and sense of limitless adventure throughout the country, including the serene beachscapes of Perth.





Adapted from *COASTAL*©
Gray Malin.
Published by Abrams.

11

Milford Sound

NEW ZEALAND

The first time I visited New Zealand I did three helicopter rides in three different regions; one over the North Island, one over the top of the South Island and one over Queenstown. Unfortunately, the weather was not great when I shot Queenstown, so I returned six weeks later to photograph this area.



UKRAINE

Pop Culture Goes to War

Since Putin's invasion, the songs have gotten more serious, the comedy has gotten grimmer and any sense of kinship with Russia has died

by **MICHAEL WASIURA**



ON THE MORNING OF FEBRUARY 24, 2022, when Russian tanks crossed the Ukrainian border and headed for Kyiv, Ukrainian pop star Jerry Heil, then 26, was best known for songs that were funny and self-aware. "Okhrana Otmena," for instance–which translates roughly as "You're Canceled"—is about a boy who calls a girl the wrong name in bed. Other songs were about things like shopping and being a vegan.

"Now though, even when people ask me to perform my prewar stuff at concerts, I personally can't bring myself to do it," Heil told *Newsweek* in late March before a concert in the western Ukrainian city of Ivano-Frankivsk. "It's a different time and culture has to reflect that difference. I have to reflect that difference, because I'm different now, too. I grew up a lot in the past year, right along with Ukraine itself."

"I remember waking up about a minute before the first explosion and not understanding why I was so nervous," she said. "Then I heard the first bomb go off and was like, 'Is that fireworks?' I came to my window and literally saw the beginning of the war. The sky was on fire."

Heil was living in a rented house in a small town just north of Kyiv, not far from Bucha and Irpin, towns whose names later became bywords for Russian barbarity. She and her brother decamped to their childhood home and after failing to convince their parents to evacuate, set off for the country's Western border. As a male of military age, Heil's brother could not leave the country, but she did, carrying her music gear into Romania on foot.

"The first song I wrote after the start of the war was called 'Putin, Go Home,'" she said, based on a Ukrainan football chant whose words translate as "Putin is a d***," Heil said. "I wanted to translate it to be a little more polite



OUTSPOKEN Opposite: Singer-songwriter Jerry Heil. Above: Director Oleg Sentsov after being released in a 2019 prisoner swap with Russia.

so that I could sing it on stage in Europe. The verses were in English, too, because I understood that it was important to attract the world's attention to what Russia was doing in my homeland."

Since then, Heil has given more concerts than she can count, donating the proceeds to the war effort back home while fighting to ensure that Western listeners do not lose interest in the Ukrainian cause.

Her story is not unique. On February 27, 2022, the day Russian forces first occupied Bucha, Andriy Khlyvnyuk, vocalist in the rock band BoomBox and a Territorial Defense Forces volunteer, was in Kyiv, wearing a New York Yankees baseball cap and carrying a rifle. Standing in front of the capital's 11th-century Saint Sophia Cathedral, he delivered an a cappella performance of the independence anthem "Oh, the Red Viburnum in the Meadow." Filmmaker and Crimea native Oleg Sentsov, who had spent five years in Russian captivity for his opposition to the 2014 annexation of his home, was not far away. After helping to defend Kyiv in the early weeks of the full war, Sentsov's service sent him to the embattled city of Bakhmut. Television presenter Serhiy Prytula put his skills to work organizing a public fundraising campaign that has provided Ukrainian forces with tens of millions of dollars' worth of gear, including Turkish-made Bayraktar drones and British armored personnel carriers.

Before the war, Ukrainian culture was marked by loud, political arguments on nearly any topic; since then, not a single prominent cultural figure or politician has come out against resistance to Russian aggression.

'Europe Is Such a Strange Place'

It is a far cry from the situation in Russia. Despite a Kremlin-controlled propaganda apparatus that has largely hidden the war's gruesome reality from most citizens, many members of the cultural elite have publicly criticized their government.

Rappers Morgenshtern, Noize MC and Oxxxymiron; singer Zemfira and television presenter Maxim Galkin are among those who have officially been designated as "foreign agents" by the authorities. Countless more have fled the country.

At a recent Moscow concert, lead singer Alexander Ivanov of the group Naiv encouraged his audience to learn about the case of 13-year-old Masha Moskaleva. After she drew a picture at school showing Russian rockets flying toward a Ukrainian mother and daughter, her father was sentenced to two years in prison for "discrediting the army." In response to Ivanov's comments, the crowd at the Naiv concert chanted "f*** the war."

> **"They can shoot dreams, but we won't let them break our spirit."**

Still, polling from the independent Levada Center routinely finds that more than 70 percent of respondents "personally support the actions of the Russian armed forces in Ukraine."

Authorities have found ways to mute even those willing to speak out. Last September, 74-year-old singer and Soviet-era icon Alla Pugacheva publicly asked to join her husband, Galkin, on the "foreign agents" registry. Rather than risk alienating Pugacheva's large, pension-aged and nostalgia-minded audience, the Kremlin turned her down. Moscow has managed to turn a so-far disastrous war of conquest into an effective tool of repression at home.

Widespread support for the war among Russians has led many Ukrainians to cut ties with friends and relatives across the border, and that bitterness has spread to Ukrainian popular culture.

"There are a lot more dead Russians in my jokes now," comedian Anton Tymoshenko tells *Newsweek*. "We've all gone a lot darker."

Comedian Hanna Kochegura offered an example. Since the start of the war, Ukrainian performers have traveled abroad to raise money for the military. When Kochegura was in Poland, she was taken aback by the presence of Russians out in public.

"It was really triggering," she says. "I hadn't heard Russian accents in real life in months, and my first psychological response was: 'The enemy's here; they're going to kill me.' That's how my brain responds now; that they're all potential murderers."

"Europe is such a strange place," she says now in her act. "There are Russians just walking around, going about their business, and nobody is killing them. In Ukraine, that simply doesn't

FROM LEFT: IRYNA SHEPETKO; STR/NURPHOTO/GETTY

happen. In Ukraine, you can kill Russians—legally—because Ukraine is the greatest country in the world."

> **"Putin has done more for Ukrainian nationalism and a sense of Ukrainian identity than centuries of Ukrainians were able to do."**

The End of Ambivalence

"When you launch a genocidal war against your neighbor, it tends to spark these kinds of feelings," Frederick Kagan of the Institute for the Study of War tells *Newsweek*. "Putin has done more for Ukrainian nationalism and a sense of Ukrainian identity than centuries of Ukrainians were able to do, and now we're watching the emergence of a Ukrainian identity that regards itself as fully independent from Russian identity."

It wasn't all that long ago that the two countries' overlapping histories served as a uniting factor. Even after Ukraine became an independent state in 1991, Ukrainians continued to flock to Russia for economic opportunities. Artists a generation older than Jerry Heil often lived, worked and earned most of their money north of the border. President Volodymyr Zelensky himself made his name in the late 1990s in a Russian comedy sketch competition where troupes vied to advance to a championship in Moscow.

"Before 2014, there was a lot of ambivalence in Ukraine about Russia," Kagan says. "Even before 2022, there were prospects for friendly relations between the two states if the Russians had been prepared to approach it in a non-imperialistic fashion. Now I think we're generations removed from the prospect of having any sort of friendly relations between the states or the people."

By the time Jerry Heil was developing a career in the late 2010s, there was enough of a domestic market that she could produce songs in her native Ukrainian and prosper, but that didn't require a total rejection of all things Russian.

When Heil was a student at the Kyiv Conservatory, she started a YouTube channel that featured a series of chorally arranged a cappella covers of other artists' songs. One of those artists was Monetochka, a Russian pop singer who in January 2023 was placed on the Kremlin's list of "foreign agents" due to her opposition to the "special military operation" in Ukraine. Before the war, she and Heil might have been collaborators, possibly even friends, but that is impossible now.

"Russian culture is based on lies, and I don't want to be connected to it in any way," Heil said. "We learn it in our literature classes, in our history classes, how for centuries Russia was trying to kill our history, to kill our best people, to kill our traditions."

In the lyrics of one song released last year, she sings, *"They can bomb happiness, they can shoot dreams, but we won't let them break our spirit/Everyone will eat what they have sown/Everyone will eat what they have sown/Everyone will eat what they have sown."*

▸ **Michael Wasiura** *is a foreign correspondent living in Ukraine and covering the war for* NEWSWEEK. *Follow him on Twitter @michael_wasiura*

REFUSENIKS Spectators hold up posters during an antiwar concert by Russian musicians Noize MC and Monetochka in Warsaw, Poland, 2022.



JANECK SKARZYNSKI/AFP/GETTY


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PARTING SHOT

Ke Huy Quan

FRESH OFF HIS OSCAR WIN FOR *EVERYTHING EVERYWHERE ALL AT ONCE,* Ke Huy Quan isn't wasting time. He'll next be seen in *American Born Chinese* (May 24 on Disney+). Based on the graphic novel of the same name by Gene Luen Yang, the series follows teenager Jin Wang (Ben Wang) who is "trying to find his own identity" when he's introduced to Chinese mythological characters that overturn his life. "It's about family. It's about love. It's about kindness." Quan plays Freddy Wong, an actor from a popular '90s sitcom whose character was based on painful Asian stereotypes. "Back then, a lot of the roles that were available to Asian actors were stereotypical, and oftentimes the butt of the joke." But, Quan says so much has changed since then. "That's why it's important to have representation. The more you see, the more you understand, and the less you're afraid of it." And Quan's openness and vulnerability in sharing his story during the awards season shows how much has changed. "For some odd reason, and I couldn't even explain it, I just wanted to tell the world my story."



"When I was first approached with this character, it scared the sh out of me."**

AMY SUSSMAN/BAFTA/GETTY

What first interested you about *American Born Chinese?*

A lot of people in the Asian community are very familiar with the Monkey King story. So, to be able to tell a version of [it] and introduce it to the American audience, that was really exciting for me.

Did similarities stand out to you between your character and career?

When I was first approached with this character, it scared the sh** out of me. A lot of times I had to tell [showrunner] Kelvin [Yu], way too similar guys, back off, don't go there, because at times I felt like I was holding up a mirror to myself. But it's important; this character shows what happens when you have portrayals like this.

Have portrayals of Asian stories in Hollywood changed for the better?

A lot has changed in the last 10 or 20 years. I'm very grateful, and I don't think we need to put blame on what happened in the past. Back then we were looking through different lenses, we're very different now, and we've evolved.

Where do you keep your Oscar?

I fantasized about that little golden statue for a long time. I couldn't believe that I was able to bring it home. It's in my home office because I have so much respect for what it stands for, so it's really high up on my shelf. Sometimes I cannot believe it has my name on it. It's my new best friend. —*H. Alan Scott*

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